Combined Efforts Built a Levee of Hope

Full Mitigation Best Practice Story

Barceloneta Municipio, Puerto Rico

Barceloneta, PR - For years, life in downtown Barceloneta had a serious drawback: repeated flooding from the Rio Grande de Manat. "After Hurricane Hortense (1996), we had carcasses of cattle and other domestic animals, in addition to four feet of mud, filth, and riverbed dirt, all over the town when the floodwaters receded. The smell was the worst. It was a disastrous, terrible experience and we needed to do something about it," explained Esther Rios, a Barceloneta Municipal Officer.

Rios, a municipal employee for nearly 16 years, has been involved in many response and recovery activities. "After Hurricane Georges (1998), we spent weeks cleaning up, and I got such a severe eye infection from the filth, that I've never been able to wear contact lenses again," explained Rios. The frequency of the flooding and its consequences triggered a joint effort led by the United State Army Corps of Engineers (USACE) to build a levee around the town.

Residents in the area had similar problems. "When we knew of the flooding ahead of time, we could elevate some of our belongings, but sometimes we had to evacuate the house or climb up to the roof for safety," explained Elba Fernandez.

With this picture in mind, the USACE, the Puerto Rico Department of Natural and Environmental Resources (DNER) and the Municipality of Barceloneta joined efforts to construct the ring levee to prevent water from entering the town. Seventy-five percent of the funding for the project came from the USACE. It conducted the studies, designed the project, prepared the plans and specifications, and supervised construction activities. The Municipality of Barceloneta was instrumental in securing Congressional support for the project. The DNER and the municipality also provided funding and real estate needed to complete the project. The total length of the ring levee is about 5.3 kilometers, with an average height above ground of 5.4 meters. This project is 95 percent complete and is already fully functional.

Two severe flooding events have already tested the levee--the November 2003 floods and Tropical Storm Jeanne (2004)--and no structure in downtown Barceloneta suffered any flood damage. "The levee performed remarkably during these events," explained Jorge Tous, an engineer with the USACE. It was designed to provide protection in even bigger storms--up to a 100-year flood (a storm with a one-percent chance of occurring every year).

The levee project has saved an estimated 27 million dollars in insurance claims and taxpayers' monies so far. In addition to private residences and businesses, public infrastructure such as roads, utilities and offices are protected. More than 2 million dollars in flood insurance claims were saved in the November 2003 flooding event alone.

The benefits to Barceloneta are clear. Moreover, the levee has not created flooding problems in adjacent areas, but diverts floodwaters into undeveloped lands. In addition, stream-flow rates of the Rio Grande de Manata have not changed, the water flows just as quickly as it did prior to construction.

Activity/Project Location	
Geographical Area:	**Single County in a State**
FEMA Region:	**Region II**
State:	**Puerto Rico**
County:	**Barceloneta Municipio**
City/Community:	**Barceloneta**

Key Activity/Project Information

Sector:	**Public**
Hazard Type:	**Flooding**
Activity/Project Type:	**Flood Control**
Activity/Project Start Date:	**11/1998**
Activity/Project End Date:	**01/2000**
Funding Source:	**Other Federal Agencies (OFA)**
Funding Recipient:	**Local Government**

Activity/Project Economic Analysis

Cost:	**$18,000,000.00 (Estimated)**

Activity/Project Disaster Information

Mitigation Resulted From Federal Disaster?	**Yes**
Federal Disaster #:	**1247 , 09/24/1998**
Value Tested By Disaster?	**Yes**
Tested By Federal Disaster #:	**No Federal Disaster specified**
Year First Tested:	**2003**
Repetitive Loss Property?	**Yes**

Reference URLs

Reference URL 1:	**http://www.usace.army.mil/public.html#Flood**
Reference URL 2:	**http://www.floodsmart.gov**

Main Points

- The total length of the ring levee is about 5.3 kilometers, with an average height above ground of 5.4 meters. This project is 95 percent complete, and is already fully functional.
- The Municipality of Barceloneta was instrumental in securing Congressional support for the project. The DNER and the municipality also provided funding and real estate needed to complete the project.
- Seventy-five percent of the funding for the project came from the USACE. They conducted the studies, designed the project, prepared the plans and specifications, and supervised construction activities.
- The levee has been tested twice since construction, preventing flooding of Barceloneta each time.

Aerial photo of levee

Elba Fernandez points to the level of floodwaters within her home.